

Big Bend's Rio Grande faces uncertain future

By Raymond Skiles and Jeff Bennett

REGIONAL AND EVEN NATIONAL media attention briefly turned to the Rio Grande in Big Bend National Park in May 2003. The river, once a mighty regional and international resource, simply stopped flowing. For a few weeks before seasonal rains began, portions of the river became only pools isolated between sun-bleached gravel beds. Historical records indicate the river stopped during droughts of the past, most recently in the 1950s. But the May event brought to light the more disturbing long-term decline of the Rio Grande ecosystem. Dams, diversions, industrial and agricultural contamination, and the invasion of exotic species are killing this river.

Dams and diversions have stopped the natural flooding that occasionally scoured banks and realigned the channel. Without regular floods the river channel grows narrower and deeper. Cobble bars that were once productive habitat for fish and invertebrates have become choked with silt and no longer support these organisms. Sustained low flow reduces dissolved oxygen, concentrates contaminants, and favors exotic species over natives that are adapted to flow variability.

The Rio Grande was once home to 38 native fish species. Two are now extinct, one is federally endangered, and nine are no longer found in the Big Bend portion of the river. Eight exotic fish species compete with natives; nine of the remaining native fish species are at risk. Nutria,

“The National Park Service and partner agencies are gathering information needed to demonstrate the relationship between river changes and resource damage.”

large South American rodents that prefer calm water, are abundant in the river. These voracious herbivores have stripped aquatic vegetation from the river and adjacent spring-fed pools that are the only habitat of endangered Big Bend mosquitofish. The elegant slider, an exotic turtle species that is suited to slow-moving water, now hybridizes with the native Big Bend slider, a species adapted to the more frequent historical flooding of the Rio Grande. Of at least five native mussels, only dead shells of three have been found in recent years.

Native plants such as cottonwood and willow are now rare. Exotic giant reed, tamarisk, bermuda grass, and other nonnatives dominate the banks. The presence of pesticides, fertilizer, and urban waste has led to warnings for humans to avoid contact with the water and consume fish only in moderation.

Though the Rio Grande is a significant resource in Big Bend National Park and is the primary resource in the Rio Grande Wild and Scenic River, park managers currently have little influence to halt or slow ongoing degradation. Water law does not allow for in-stream flow rights, while competition for regional water sources is increasing. Regardless, the National Park Service and partner agencies are gather-



Mariscal Canyon, start of the Rio Grande Wild and Scenic River designation in Big Bend National Park, was reduced to pools of water isolated by sun-bleached gravel beds in May. The flow stoppage highlights the effects of drought, to be sure, but also the effects of dams and diversions; agricultural, urban, and industrial contamination; and exotic species invasion. Park staff has little influence to slow the degradation of river resources.

ing information needed to demonstrate the relationship between river changes and resource damage. These partnerships and recent NPS initiatives such as the Natural Resource Challenge have resulted in baseline assessments of channel characteristics, water quality, flow cycles, and species inventory, but essential information is still missing. What are the requirements for minimum flow, water quality, and channel conditions that will sustain species now declining or favor natives over exotics? Where will local springs and tributaries provide enough water to attempt restorations? And most significantly, how can park managers help to reverse the effects of decades of decline?

Historical trends leave little room for optimism about the Rio Grande's future. Will the river be reduced to pretty scenery on the surface and waste transport below? Or can its ecological integrity be rescued? Only a combination of societal values that create policy and legal opportunities, and sound science that demonstrates resource needs, will provide real opportunities to improve the Rio Grande. ■

raymond_skiles@nps.gov

Wildlife Biologist, Big Bend National Park, Texas

jeffery_bennett@nps.gov

Physical Scientist, Big Bend National Park, Texas